

Pending Claims:

Following is a complete listing of the claims pending in the application, as amended:

1-51. (Cancelled)

52. (Withdrawn) A tool set configuration for fabricating interconnect metallization structures on a workpiece, comprising:

a film deposition tool set having a first vapor deposition station for depositing a barrier layer on a workpiece;

a pattern processing tool set including a coating station for depositing a resist on the workpiece and an exposure apparatus configured to expose selected portions of the resist to a radiation for forming a patterned mask; and

a wet processing tool set including a plating station for plating metal into recesses formed in the resist to form interconnect metallization structures over portions of the barrier layer and a first processing station for electrically isolating the metallization structures.

53. (Withdrawn) The tool set configuration of claim 52 wherein the film deposition tool set further comprises a second vapor deposition station for depositing a seed layer onto the barrier layer.

54. (Withdrawn) The tool set configuration of claim 52 wherein the wet tool set further comprises a rinse/dry station for removing resist from the workpiece.

55. (Withdrawn) The tool set configuration of claim 52 wherein:
the wet tool set further comprises an etching station;
the plating station of the wet tool set comprises an electroplating station; and
the first processing station of the wet tool set comprises an oxidizing station.

56. (Withdrawn) The tool set configuration of claim 52 wherein:
the film deposition tool set further comprises a second vapor deposition station
for depositing a seed layer onto the barrier layer; and
the wet tool set further comprises an etching station, the first processing station
of the wet tool set comprises a rinse/dry station for removing resist from
the workpiece, the plating station of the wet tool set comprises an
electroplating station, and the wet tool set further comprises an oxidizing
station.

57. (Previously Presented) A method of fabricating interconnect metallization
structures on a workpiece, comprising:
applying a conductive barrier layer to the workpiece in a film deposition tool set;
forming a patterned resist layer on the workpiece, the patterned resist layer being
a mask having openings in a pattern of interconnect metallization
structures;
plating a metal into the openings of the resist layer in a wet processing tool set to
form the interconnect metallization structures; and
altering portions of the barrier layer to electrically isolate the interconnect
metallization structures from each other in the wet processing tool set.

58. (Previously Presented) The method of claim 57 wherein plating a metal
into the openings comprises electroplating copper onto exposed portions of the barrier
layer in the openings.

59. (Previously Presented) The method of claim 57 further comprising
applying a seed layer onto the barrier layer in the film deposition tool set, and wherein
(a) the openings in the resist layer expose portions of the seed layer and (b) plating a
metal into the openings comprises electroplating copper onto the exposed portions of
the seed layer.

60. (Previously Presented) The method of claim 57 further comprising electroplating a protective layer onto surfaces of the interconnect metallization structures.

61. (Previously Presented) The method of claim 57 wherein altering portions of the barrier layer to electrically isolate the interconnect metallization structures from each other comprises oxidizing portions of the barrier layer between the interconnect structures.

62. (Previously Presented) The method of claim 57 wherein altering portions of the barrier layer to electrically isolate the interconnect metallization structures from each other comprises removing portions of the barrier layer between the interconnect structures.

63. (Previously Presented) The method of claim 57 further comprising applying a seed layer onto the barrier layer in the film deposition tool set, and wherein altering portions of the barrier layer to electrically isolate the interconnect metallization structures from each other comprises oxidizing portions of the barrier layer between the interconnect structures.

64. (Previously Presented) The method of claim 57 further comprising applying a seed layer onto the barrier layer in the film deposition tool set, and wherein altering portions of the barrier layer to electrically isolate the interconnect metallization structures from each other comprises removing portions of the barrier layer between the interconnect structures.

65. (Previously Presented) A method of fabricating metal interconnect structures on a workpiece, comprising:

applying a barrier layer to the workpiece in a first deposition station of a film deposition tool set;

applying a copper seed layer to the barrier layer in a second deposition station of the film tool set;

forming a patterned mask of a resist on the copper seed layer, the patterned mask having a plurality of openings defining locations for forming raised metal interconnect structures on the seed layer;
plating copper onto the copper seed layer in the openings of the patterned mask in a first wet processing station of a wet tool set to form copper interconnect structures;
removing the patterned mask in second wet processing station of the wet tool set; and
removing portions of the seed layer between the copper interconnect structures in a third wet processing station of the wet tool set.

66. (Previously Presented) The method of claim 65 wherein plating copper onto the copper seed layer comprises electroplating copper.

67. (Previously Presented) The method of claim 65 wherein:
plating copper onto the copper seed layer comprises electroplating copper; and
removing portions of the seed layer between the copper interconnect structures comprises etching the copper seed layer.

68. (Previously Presented) The method of claim 65 wherein:
plating copper onto the copper seed layer comprises electroplating copper; and
the method further comprises exposing the workpiece to an oxygen-containing environment to form a first oxide on the copper interconnect structures and a second oxide between the copper interconnect structures, removing the first oxide over the copper interconnect structures, and plating a protective layer onto surfaces of the copper interconnect structures.

69. (Previously Presented) The method of claim 68 wherein removing portions of the seed layer between the copper interconnect structures comprises removing the second oxide from between the copper interconnect structures.